

## Case Report

# Goblet Cell Carcinoma of the Appendix: A Case Report on Goblet Cell Carcinoid

Sheliza Kabani, MD,<sup>1</sup> Aubtin Saedi, BS,<sup>1</sup> Austin Lehr, DO,<sup>1</sup> Lina O'Brien, MD<sup>1</sup>

### Abstract

#### Description

Goblet cell carcinoid of the appendix is a rare neoplasm with histological features of both neuroendocrine and adenocarcinomas. The combination of its aggressive behavior, infrequent occurrence, and variable clinical presentation convolutes the management of this tumor.

We report the case of a 75-year-old female presenting with acute appendicitis. A laparoscopic appendectomy was performed. The pathology report showed goblet cell carcinoid at the base of the appendix with involvement of the proximal surgical margins. At her postoperative visit, the patient's pathology report and options for management were reviewed, and the patient agreed to proceed with a right hemicolectomy 8-10 weeks after her appendectomy.

#### Keywords

carcinoid tumor; goblet cell carcinoid; appendix; appendectomy; hemicolectomy; neuroendocrine tumor; appendiceal neoplasms; appendicitis; appendiceal tumor; immunochemistry

#### Introduction

Tumors of the appendix are uncommon and are encountered in about 1% of appendectomy specimens. Goblet cell carcinoids (GCC) are a particularly rare subtype of appendiceal neoplasms, accounting for less than 14% of all appendiceal tumors.<sup>1</sup> The origin of GCC is unclear, but may be a pluripotent intestinal epithelial crypt base stem cell. GCC exhibits histologic features of both neuroendocrine and glandular tissue, yet follows a more aggressive course than classic neuroendocrine tumors of the appendix. The incidence of GCC is 0.01 to 0.05 per 100,000 per year and lends to the relatively limited clinical experience with these tumors.<sup>2</sup> Previous studies suggest that there is an equal male-to-female distribution and that the mean age of diagnosis is in the mid to late fifth decade.<sup>3</sup> Clinical presentations of GCC are varied, but most commonly involve abdominal pain and acute appendicitis, which is seen in over half of cases. Diagnosis is usually con-

firmed incidentally by a pathologist following appendectomy or ileocecal resection. Roughly 25% of patients present with a perforated appendix and up to 50% of patients may present with metastatic disease.<sup>3</sup>

#### Case Presentation

A 75-year-old female with a past medical history of hypertension presented with abdominal pain. The patient reported the development of abdominal pain starting 3 days prior to presentation. The pain started around her umbilicus then radiated over to the right side of the abdomen. The patient rated the pain level as 7/10 and described it as a sharp pain that was constantly present. She complained of nausea and vomiting since the pain started. She denied diarrhea, any recent falls or injury, and any exposure to ill contacts. On physical exam, her vital signs were temperature of 37.6° Celsius, pulse of 86 beats per minute, respirations of 16 breaths per minute, and blood pressure 142/89

Author affiliations are listed at the end of this article.

Correspondence to:

Austin Lehr, DO

Lina O'Brien, MD

Menorah Medical Center

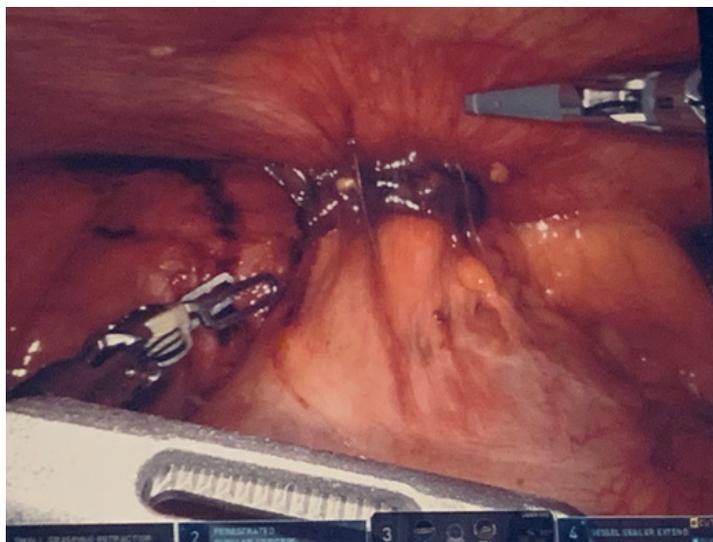
5721 W 119th St

Overland Park, KS, 66209

([Austin.Lehr@](mailto:Austin.Lehr@HCAHealthcare.com)

[HCAHealthcare.com](mailto:HCAHealthcare.com);

[Lina.OBrien@hcamidwest.com](mailto:Lina.OBrien@hcamidwest.com))



**Figure 1.** Right colon attached to abdominal wall due to previous surgery (appendectomy).

mmHg. The abdomen was soft, without rebound or guarding. Positive tenderness at McBurney's point (RLQ point 1/3 of the distance from the iliac spine to the navel) was noted, with negative Psoas and Obturator's signs (patient lies on his or her back with the hip and knee both flexed at 90°). On admission, her white blood cells were elevated at 15900/ $\mu$ L, while her absolute neutrophils were elevated at 13400/ $\mu$ L. Her hemoglobin, and basic biochemistry panel were within normal limits. CT of the abdomen and pelvis with contrast showed findings consistent with acute appendicitis.

The patient was taken to the operating room for urgent laparoscopic appendectomy. Grossly, the appendix appeared acutely inflamed suggestive of acute appendicitis. Good hemostasis was visualized on the staple line and the appendix was removed in an endocatch bag. The patient recovered well from surgery and did well on post op day 1. Her pain was well controlled, she was ambulating and tolerating a regular diet. The patient denied nausea and vomiting, was urinating without issue and was discharged in stable and improved condition on post operative day 1.

The final pathology report showed goblet cell carcinoid of the appendix with the tumor involving the proximal surgical margin. The details of the pathology report are as follows:

Histologic sections revealed a neoplastic proliferation comprised of uniform cells with mucin vacuoles arranged in cohesive clusters

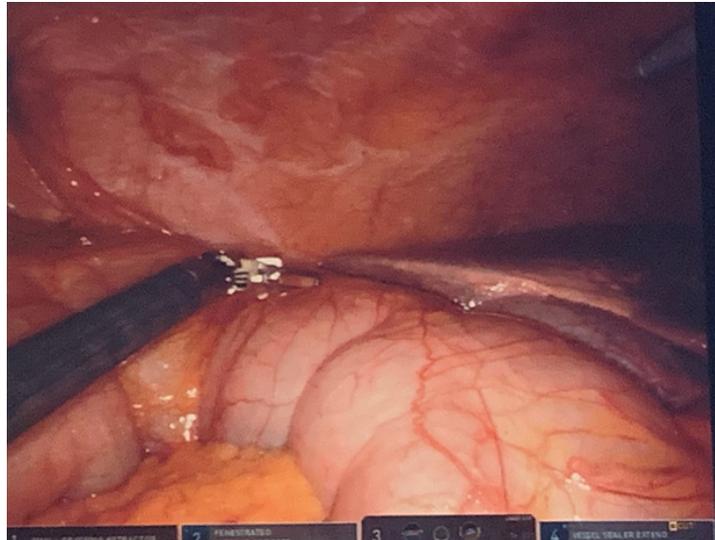
infiltrating the appendiceal wall without eliciting a stromal reaction.

Immunohistochemical stains for pancytokeratin (CKAE1/AE3), Monoclonal CEA, CAM5.2, CK7, CK20, CDX2, E-cadherin, chromogranin, and synaptophysin were performed on paraffin-embedded tissue. Controls show appropriate reactivity with the following results in tumor cells:

- Pancytokeratin (CKAE1/AE3): Positive.
- Monoclonal CEA: Positive.
- E-cadherin: Positive.
- CK7: Positive.
- CK20: Positive.
- CAM5.2: Positive.
- CDX-2: Positive.
- Synaptophysin: Focally positive.
- Chromogranin: Negative.

This immunoprofile supports the diagnosis of goblet cell carcinoid.

During her postoperative visit at 2 weeks post-operatively, the patient's questions were answered and she was given details on goblet cell carcinoid of the appendix including management options. The patient decided to proceed with a right hemicolectomy about 6 weeks after her initial surgery, as she wanted to get the surgery done before an upcoming trip. Pathology from the right hemicolectomy showed no evidence of goblet cell carcinoid, with 0 of 20 lymph nodes positive for carcinoid. Small bowel and colonic segments were also found to be free of carcinoid.



**Figure 2.** Right colon with normal hepatic flexure and gallbladder.

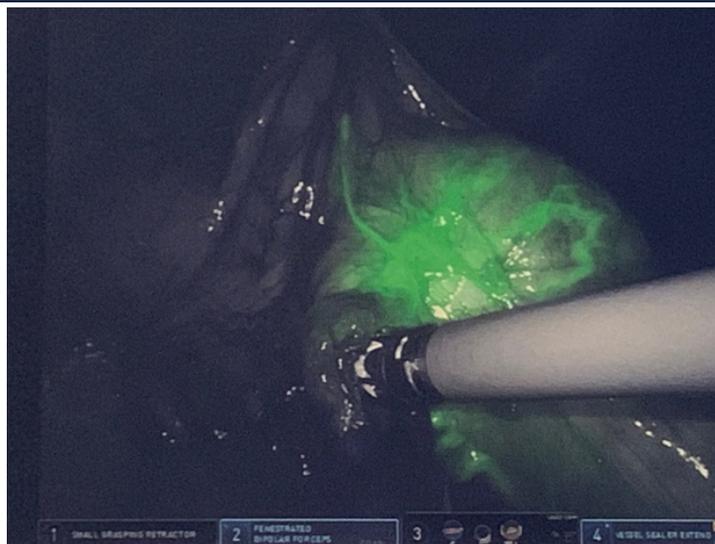
The tumor invaded through the muscularis propria into the subserosa but did not extend into the serosa. The proximal margin was involved without evidence of lymphovascular involvement or regional lymph nodes. The pathological classification is pT3 N0 (tumor has grown through the muscularis propria and into the subserosa with no positive nodes). **Figures 1-4** show the right hemicolectomy performed on our patient with a da Vinci robot. Indocyanine green was used to confirm adequate blood flow in the transverse colon and the ileum.

They have an incidence of approximately 0.01 to 0.05 per 100,000 per year.<sup>4</sup> The average age at presentation is in the mid to late fifth decade. Males and females are affected in roughly equal ratios, but Caucasians are more likely to be affected than other ethnicities. Patients most commonly present with abdominal pain and/or distension and a clinical picture consistent with acute appendicitis. Some studies suggest that up to 40% of cases present with distant metastases to the peritoneum, liver, and/or ovaries.<sup>4</sup>

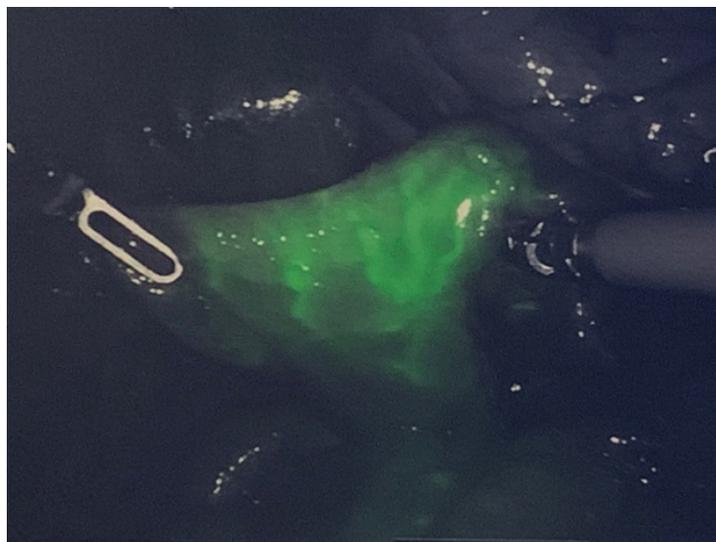
### Discussion

Goblet cell carcinoids are extremely rare and aggressive primary neoplasms of the appendix.

In general, patients with the following characteristics should undergo right hemicolectomy:<sup>5</sup> tumors located at the base of the appendix, tumors greater than 2 cm, pT3 or pT4 lesions,



**Figure 3.** Indocyanin green showing adequate bloodflow in the transverse colon.



**Figure 4.** Indocyanin green showing adequate bloodflow through the ileum.

higher grade histology with signet ring (Tang grade B or C) locally advanced or with positive surgical margins. Adjuvant chemotherapy with 5-fluorouracil has been recommended in patients with stage II (especially those with Tang B and C), stage III, and stage IV disease due to the high rate of relapse.<sup>5</sup> Specifically, the 5-year survival rates for stage II, III, and IV disease is 76%, 22%, and 14%, respectively.<sup>6</sup> Literature reports that the overall 5-year survival rates for patients with combined stages II to IV who underwent appendectomy versus right hemicolectomy were 43% and 34%, respectively ( $P = 0.604$ ) and the corresponding survival rates for adjuvant chemotherapy versus no chemotherapy were 32% and 27%, respectively ( $P = 0.151$ ).<sup>7</sup> For those patients with high risk of relapse, various surveillance methods have been suggested. These include scheduling office visits with a full history and physical exam and obtaining laboratory measurement of carcinoembryonic antigen (CEA) levels every 3 months. CT of chest, abdomen, and pelvis should be done every 6 months for the first 2 years after diagnosis, then annually for up to 5 years.<sup>8</sup>

Patients who present with goblet cell carcinoid raise suspicion for acute appendicitis and thus routinely undergo CT imaging, which most commonly supports the diagnosis. True diagnosis, however requires a tissue specimen, which is most often procured during surgical resection. Histologically, these tumors express cell markers and characteristics of both neuroen-

docrine and glandular tissue. Notably, their behavior is more aggressive than neuroendocrine tumors of the appendix. Due to the possibility of spread, surgical management is often not limited to simple appendectomy. Upon receipt of the pathology report, the surgeon should educate the patient regarding the risk for distant metastasis and thus offer other treatments including chemotherapy and/or right hemicolectomy, as was done in our case.

### Conflicts of Interest

The authors declare they have no conflicts of interest.

The authors are employees of Menorah Medical Center, a hospital affiliated with the journal's publisher.

This research was supported (in whole or in part) by HCA Healthcare and/or an HCA Healthcare affiliated entity. The views expressed in this publication represent those of the author(s) and do not necessarily represent the official views of HCA Healthcare or any of its affiliated entities.

### Author Affiliations

1. Menorah Medical Center, Overland Park, KS

### References

1. Isaacson P. Crypt cell carcinoma of the appendix (so-called adenocarcinoid tumor). *Am J Surg Pathol*. 1981;5(3):213-224. <https://doi.org/10.1097/00000478-198104000-00001>

2. Burke AP, Sobin LH, Federspiel BH, Shekitka KM, Helwig EB. Goblet cell carcinoids and related tumors of the vermiform appendix. *Am J Clin Pathol*. 1990;94(1):27-35. <https://doi.org/10.1093/ajcp/94.1.27>
3. Klein HZ. Mucinous carcinoid tumor of the vermiform appendix. *Cancer*. 1974;33(3):770-777. [https://doi.org/10.1002/1097-0142\(197403\)33:3%3C770::AID-CN-CR2820330324%3E3.0.CO;2-J](https://doi.org/10.1002/1097-0142(197403)33:3%3C770::AID-CN-CR2820330324%3E3.0.CO;2-J)
4. Warkel RL, Cooper PH, Helwig EB. Adenocarcinoid, a mucin-producing carcinoid tumor of the appendix: a study of 39 cases. *Cancer*. 1978;42(6):2781-2793. [https://doi.org/10.1002/1097-0142\(197812\)42:6%3C2781::aid-cnrcr2820420638%3E3.0.co;2-b](https://doi.org/10.1002/1097-0142(197812)42:6%3C2781::aid-cnrcr2820420638%3E3.0.co;2-b)
5. van Eeden S, Offerhaus GJ, Hart AA, et al. Goblet cell carcinoid of the appendix: a specific type of carcinoma. *Histopathology*. 2007;51(6):763-773. <https://doi.org/10.1111/j.1365-2559.2007.02883.x>
6. Byrn JC, Wang JL, Divino CM, Nguyen SQ, Warner RR. Management of goblet cell carcinoid. *J Surg Oncol*. 2006;94(5):396-402. <https://doi.org/10.1002/jso.20587>
7. Chen V, Qizilbash AH. Goblet cell carcinoid tumor of the appendix. Report of five cases and review of the literature. *Arch Pathol Lab Med*. 1979;103(4):180-182.
8. Rutledge RH, Alexander JW. Primary appendiceal malignancies: rare but important. *Surgery*. 1992;111(3):244-250.